REMARKS

This paper is responsive to the Office Action of September 10, 2004. Claims 1 and 2 are pending in this application and have been rejected. Claim 1 has been amended to include the limitations of claim 2. Reexamination is respectfully requested in light of the following remarks and analysis of the references.

Applicant respectfully traverses the rejection of both original claims 1 and 2 (now claim 1) as being obvious over the combination of US Patent 5,374,953 in view of Nakamura '943. Attached hereto is a retyped copy of Applicant's amended claim 1 which includes reference numerals to Applicant's specification to further assist the Examiner in considering patentability of the claims with respect to the outstanding prior art.

US Patent 5,374,953 Sasaki

The Examiner has rejected both original claims 1 and 2 (now claim 1) as being unpatentable over Sasaki '953 in view of Nakamura '943.

First the Examiner asserts that Figure 17 of Sasaki teaches an electronic endoscope having pixel different densities which are different from each other (citing (117b) of Figure 17). This observation is respectfully traversed because the description of Figure 17 shows that the CCD's (117a) and (117b) have exactly the same resolution. They are used as described at column 14 as follows:

> "The first CCD (117a) and second CCD (117b) are fitted to the two surfaces of a prism (116) arranged in the rear of this objective optical system (115) so that, by the above described space pixel displacing method, the pixel pitches may be displaced by ½ from each other with respect to the optical axis of the objective optical system (115)." (Column 14, lines 10 - 17)

The only way high density can be achieved by this method is if the pixel density is the same. The displacement by ½ allows identical CCD's to be used to provide additional lines. The specification continuing in column 14 and column 15 describes the operation of the CCD's, the MUX circuit (126) which multiplexes the signals from (117a) and (117b), and the final output of a single picture at the monitor (113). Note also that the signal processing and signal monitoring become common at (128). As shown in Figure 17, there is no switching back and forth between different density or different types of CCD's as the Examiner asserts.

Figure 17 does show first and second CCD driving circuits. These are controlled by timing generator (123) and, as explained, are necessary in order to perform the line by line measurement.

The processor unity (110) of Figure 17 is not for connecting first or second electronic endoscopes. Instead, the processor connects both simultaneously after receiving the multiplex signals from MUX (126).

The Examiner cites a selection circuit (132) for activating drive pulse generating circuits. However, this has no effect on the drive pulses which are actually sent from circuits (122a), (122b), which are controlled by a timing generator (123).

The Examiner asserts that there is a synchronization circuit (126) in Figure 17. This is believed to be incorrect. Circuit (126) is a multiplexer for multiplexing the signals from the two identical CCD's (117a) and (117b).

The Examiner further asserts at page 3, line 3 that there is a signal processing circuit (128) for performing imaging processing. This is believed to be incorrect. There is no single frame memory (127) as described at column 14, lines 40 - 50 which feeds the entire picture to the signal processing circuit (128). By the time the signal reaches processing circuit (128) it is combined as a signal picture. This is not a selection of one picture over another.

US Patent 5,614,943

The Examiner has asserted that Nakamura '943 teaches a second endoscope with automatic determining of the type of electronic endoscope which is connected to the processor unit. Applicant respectfully traverses this observation by the Examiner. '943 consistently in all of its examples either manually switches or plugs in different drive signal conversion apparatus to change the configuration of the system. In no case does '943 eliminate duplication of apparatus which is an object of Applicant's invention as explained in Applicant's specification.

In '943, Figures 1 - 3 show a first embodiment. In this first embodiment, there is a first CCD driver (3A) and a second CCD driver (3B) (Figure 2). These items are each plugged into the CCU (camera control unit) (4) which is shown in Figure 3. Observation of Figures 2 and 3 as well as a text describing them shows that in this embodiment there is no determination by a microprocessor of the type of endoscope or CCD connected. Instead, each CCD has a unique CCD driver (2A) or (2B). The Examiner is requested to refer to column 5, lines 20 - 35 which explain the separate operation of drivers (3A) and (3B). Still further, the replacement or switching of drivers is described in column 7, lines 15 - 26.

The second embodiment referred at the bottom of page 7 and in reference to Figure 4 does not relate to changing of CCD drivers, but the internal operation of a single driver.

A third embodiment of the invention is shown in Figures 5 - 8. In the third embodiment, there are again a plurality of endoscopes, but as shown in Figures 5 and 6, there is no determination by a processor of which endoscope is attached. Instead, as shown in Figure 5, the CCD (32A) is connected directly to CCU (38). On the other hand, as shown in Figures 6, 7 and 8, when another CCD, CCD-(B), is used, a further circuit (34B) consisting of a drive signal converting means and output format converting means (52) and (54) is used. The details of circuits (52) and (54) are shown in Figures 7 and 8. In both cases, the CCU remains CCU (38). There is no determination by CCU (38) as to what kind of endoscope is connected (see column 9, lines 40 - 67).

Figure 9 shows yet another embodiment where drive signal converting means and output format converting means are arranged separately. As described at column 10, and as shown in Figure 9, there is simply no sensing by a microprocessor of the type of CCD attached (CCD-(A) or CCD-(B)). The operation through straight conversion and non-recognition is best described at column 10, lines 18 - 43.

In Figures 13 and 14 there are shown a fourth embodiment which again relies upon substitution of drivers and does not perform substitution of drivers by determination by the CCU or a microprocessor. Instead, as illustrated in Figure 14, a first or second CCD is plugged into a common CCU (124) and contact is made at connectors (125) and (126).

Based upon this background, the reader of '943 then is introduced to Figure 16. Figure 16 shows a first driver (123) and a second driver immediately below it, but not labeled. The second driver should be labeled as (123B) in accordance with the text. However, it is clear that the first driver has a first drive pulse generating circuit (10A)which is compatible with CCD-(A) and the second drive has a second drive pulse generating (10B) which is compatible with CCD-(B). The Examiner points to switch (128) and asserts that switch (128) is controlled by a synchronization circuit (24). Circuit (24) is in fact a superimpose circuit and not a synchronizing signal generating circuit. Synchronizing circuit signal generating circuit is reference numeral (18). This is exactly the same as all of the synchronizing signal generating circuits (18) shown in the previous embodiments. There is no disclosure at all that the synchronizing signal generating circuit (18) of Figure 16 is any different, much less that it sends a signal to switch circuit (128) to cause the switch circuit to change. Superimposed circuit (24) relates to video processing, and has nothing

whatsoever to do with pulse generation and compatibility (synchronization) required for different types of CCD's. The text of '943 makes it clear that switch (28) has no relationship to the microcomputer or any determination circuit. The text states as follows:

> "The switch circuit (128) is so arranged as to be selectively switched to either one of the two CCD drivers connected through electronic contacts (125) and (126), manually or the like."

The only thing that '943 teaches is manual.

The consistency of '943 is born out by the fact that in the embodiment shown in Figures 17 and 18, instead of utilizing any sort of determination by the CCU, when the endoscope devices (71A) or (71B) (Figures 17 and 18) are switched, there also takes place a switching of the drives. The drives are located at the cable portions (135A) and (135B) and this is described at column 14, lines 33 - 35 and column 14, lines 39 - 42). Be there any doubt, the circuitry described as being located at (135) is described as circuitry found in Figure 9C (see column 14, lines 29 - 43).

Finally, Figures 19 and 20 (sixth embodiment, column 14, line 52) are also consistent with the manual approach of '943. These Figures show switches (141) and (142) which are used to switch in and out process circuits (74B) and (74A) (note that these Figures are similar to 9A and 9B). This switching in and

switching out of the circuitry is accomplished by a mere manual switch (143). Again, there is no teaching of or suggestion of any determination as claimed by Applicant.

Applicant claims a selection circuit for activating the second drive pulse generation circuit when the second electronic endoscope is connected. This selection circuit is part of the processor unit and not a manual switch such as switch (143) of '943.

As stated in claim 2 (now claim 1), Applicant requires a determination circuit for automatically determining the type of electronic endoscope which is connected to the processor unit. This is simply not found or suggested in '943.

The invention of amended claim 1 has the characteristic points of a) - c). These are:

a) the synchronization circuit of the side of the processor forms synchronizing signals which are synchronous with the drive pulse of the second drive pulse generation circuit,

b) this synchronization circuit is provided to the processor that is the signal processing system,

c) as a result, the signal processing circuit forms an image, and processing on the output signal from the

second imaging device by inputting the synchronizing signals from the synchronization circuit.

These features are not disclosed in the reference of '953 (Sasaki) and '943 (Nakamura). The MUX circuit (126) of '953 (Fig. 17) is not the synchronization circuit and is the multiplexer. Moreover, this MUX circuit (126) is not synchronous with the drive pulse of the second drive pulse generation circuit. In Figure 17, the first and second CCD driving circuits are synchronous by timing generator (123).

That is, '953 provides the synchronizing signal to the CCD drive system (the first and second CCD driving circuits) so as to conform to the signal processing system, and '953 is taking synchronization from the CCD drive system. To the contrary, Applicant's invention is synchronous with the drive pulse of the second drive pulse generation circuit, and Applicant's invention is taking synchronization from the signal processing system.

The drive-signal converting means (52) of '943 (Fig. 6, Fig, 7) converts the drive signal from the drive-signal generating circuit (46), and provides the converted drive signal to the CCD (32b).

In the case where the CCD drive system is synchronized like the reference, the photo-electric conversion time of the CCD does

not become certain quantity, so that Iris conversion etc. becomes needed. Also, the reality of the horizontal direction does not become certain, for example, the circle becomes an ellipse. (Horizontal resolution changes in Applicant's invention.) It must do the resolution and the processing zoom and etc. of the image signal. There is not such a problem in the invention of claim 1 as amended.

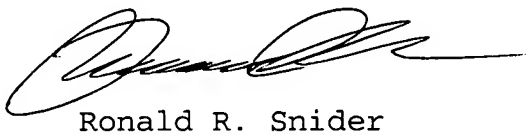
Summary

It is, therefore, respectfully submitted that '953 (Sasaki) in view of '943 (Nakamura) simply does not teach or suggest Applicant's invention as the Examiner would assert. Reexamination is respectfully requested.

In view of the foregoing, it is respectfully submitted that the application is now in condition for allowance, and early action in accordance thereof is requested. In the event there is any reason why the application cannot be allowed in this current

condition, it is respectfully requested that the Examiner contact the undersigned at the number listed below to resolve any problems by Interview or Examiner's Amendment.

Respectfully submitted,



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Claim 1 With Reference Numerals

An electronic endoscope apparatus, including:

a first electronic endoscope (10A) having a first imaging device (14A);

a second electronic endoscope (10B) having a second imaging device (14B) of which pixel density is different from that of said first image device (14A), and having a second drive pulse generation circuit (16B) for generating drive pulses to drive the second imaging device (14B); and

a processor unit (12) for connecting said first (10A) or second electronic endoscope (10B),

wherein the processor unit (12) comprises:

a first drive pulse generation circuit (16A) for generating drive pulses to drive said first imaging device (14A);

a selection circuit (19) for activating the second drive pulse generation circuit (16B) when said second electronic endoscope (10B) is connected;

a synchronization circuit (20) for forming synchronizing signals which are synchronous with the drive pulse of said second drive pulse generation circuit (16B);

a signal processing circuit (23) for performing image processing on the output signal from said first imaging device (14A) when said first electronic endoscope (10A) is connected, and for performing image processing on the output signal from the

second imaging device (14B) by inputting the synchronizing signals from said synchronization circuit (16A) when the second electronic endoscope (10B) is connected; and

wherein a determination circuit for automatically determining the type of the electronic endoscope which is connected to said processor unit (22) is provided, and said selection circuit and synchronization circuit (20) are operated based on the determination of the determination circuit.